

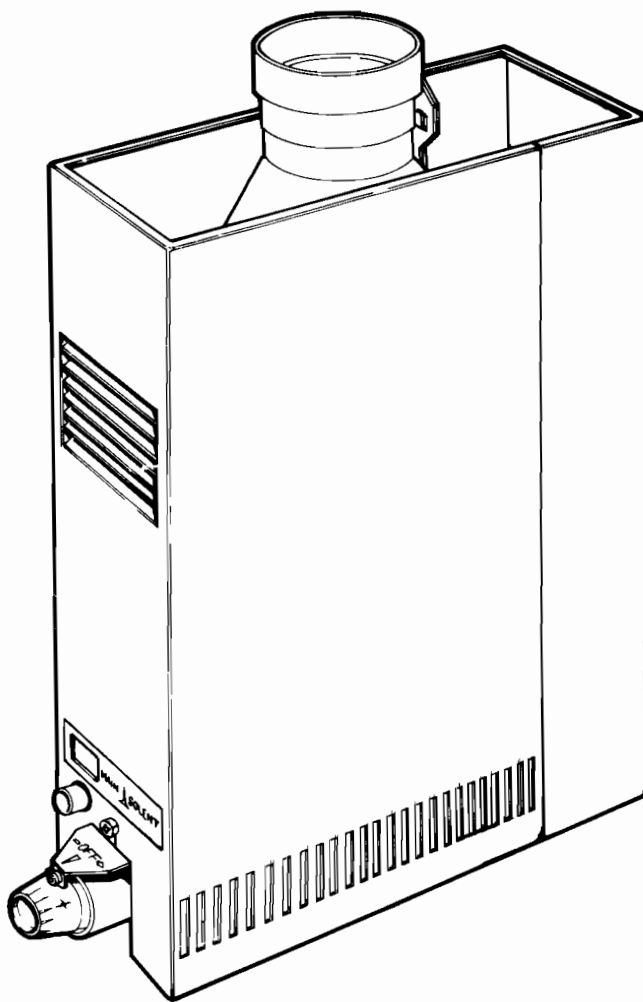


SOLENT

GAS FIRED CIRCULATOR

INSTALLATION AND SERVICING INSTRUCTIONS

FOR USE WITH NATURAL GAS



SOLENT Model 671 G.C. Appliance 53 476 20

GAS SAFETY REGULATIONS, 1972

In your own interest, and that of safety, it is the law that all gas appliances are installed by competent persons, in accordance with the above regulations.

Failure to install appliances correctly could lead to prosecution.



I N D E X

Appliance Diagram and Key Numbers	Page 3
Fixing the Solent	Page 4
Water System — General Recommendations	Pages 4 and 5
Water Connections	Page 5
Flue System and Ventilation	Page 6
Gas Supply — Recommendations and Connections	Page 6
Preliminary Checks and Commissioning the Solent	Page 7
Fault Finding Chart	Pages 7 and 8
Servicing Instructions	Page 9
Dismantling the Appliance	Pages 10, 11 and 12
To remove Complete Control Assembly	Page 10
To Remove Multifunctional Control Unit	Page 10
To Remove the Burner	Page 10
To Remove the Thermocouple	Page 11
To Remove the Pilot Injector (and Pilot Filter)	Page 11
To Remove Spark Electrode	Page 11
To Remove the Spark Generator	Page 11
To Remove the Primary Flue	Page 11
To Remove the Heat Exchanger	Page 12
Short Spare Parts List	Page 12

TECHNICAL DATA

NOMINAL HEAT INPUT 4.3 kW (15.83 MJ/h) (15,000 Btu/h)
 NOMINAL HEAT OUTPUT 3.4 kW (12.13 MJ/h) (11,500 Btu/h)

DIMENSIONS	HEIGHT	WIDTH
Overall mm (ins)	512.7 (20¼)	112.7 (4½)
	DEPTH	
	347 (13 21/32)	

WEIGHT EMPTY kg (LB) 6.86 (15.25)
 WATER CAPACITY LITRES (GALLS.) 0.60 (0.132)

Gas Pressures

Table 1

Inlet Pressure		Nominal Burner Pressure		Injector
mbar	"w.g.	mbar	"w.g.	320
20	8	19.3	7.75	

MAIN SOLENT

671 MODEL

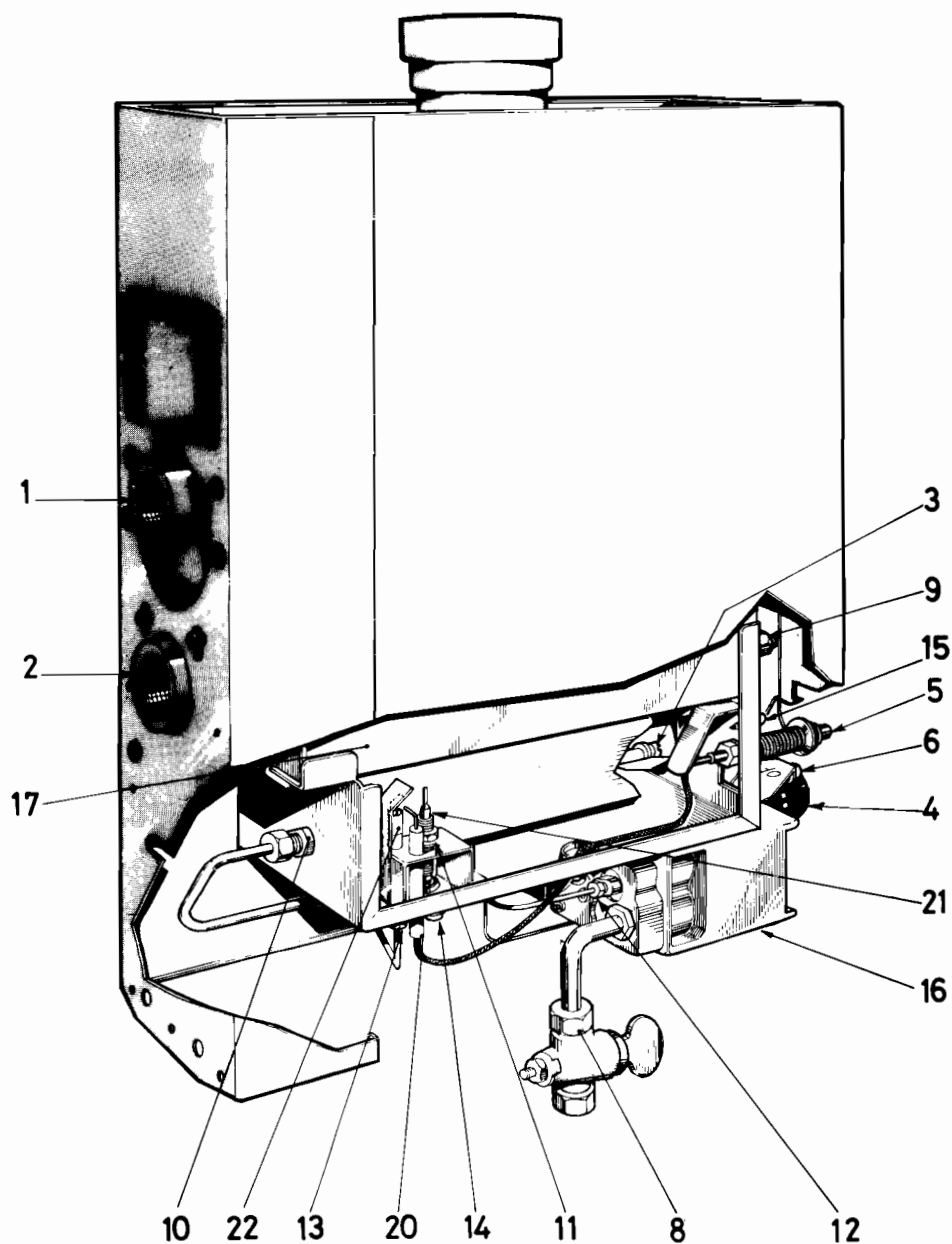


Fig. 1

Appliance Diagram Key Numbers

- | | |
|----------------------------------|---|
| 1. Flow Pipe Connection | 12. Thermocouple to Control Unit Connection |
| 2. Return Pipe Connection | 13. Pilot Securing Nut (and Pilot Filter) |
| 3. Pressure Test Point | 14. Electrode Securing Screw |
| 4. Control Knob | 15. Igniter Securing Screw |
| 5. Spark Generator Button | 16. "Babysit" Control Unit |
| 6. Temperature Stop Screw | 17. Water Heating Unit |
| 7. Case Fixing Screw (not shown) | 18. Not applicable to this model |
| 8. Gas Inlet Connection | 19. Not applicable to this model |
| 9. Heating Unit Securing Nuts | 20. Spark Electrode |
| 10. Main Injector | 21. Thermocouple |
| 11. Thermocouple Securing Nut | 22. Pilot |

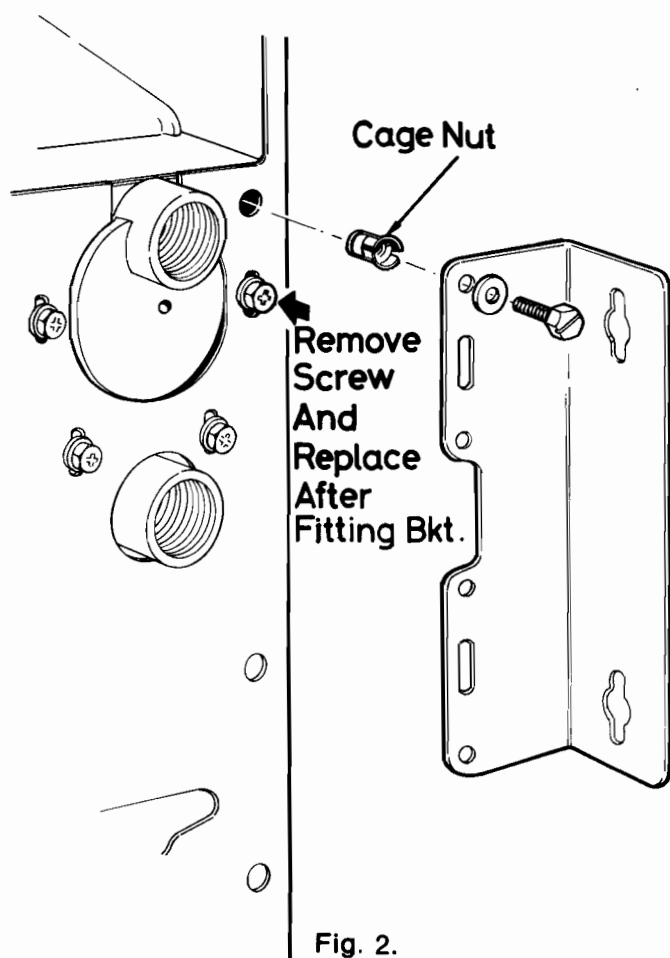


Fig. 2.

FIXING THE SOLENT

Remove single screw securing outer case above the control knob.

Remove outer case by lifting slightly upwards to clear locating lugs at rear of case and pulling forward.

The mounting bracket can be positioned at the left hand side, right hand side or alternatively at the bottom of the backplate.

Choose the appropriate position and then push the two cage nuts (supplied loose) into the backplate and screw on the fixing bracket using the two screws provided (See Fig. 2).

NOTE: If the left or right hand position is chosen, it will be necessary to remove the screw which is already securing the heating unit before fixing the bracket (See Fig. 2).

IMPORTANT: To facilitate servicing and to allow adequate access for combustion air the minimum clearances around the appliance must be observed:

- i) From the front of the case forward to the wall 240 m.m. (9.7/16).
- ii) When wall mounted a floor clearance of 25 m.m. (1 in.).
- iii) When floor mounted a wall clearance of 20 m.m. (13/16 in.).
- iv) From the backplate to the wall 80 m.m. (3.5/32 in.) to allow for water connections.

Secure the mounting bracket to the floor or wall using appropriate method of fixing e.g. wall plugs and screws. The distance between the centres of the wall/floor fixing points on the mounting bracket is 114 m.m. (4½ in.).

WATER SYSTEM — General

In hard water areas an indirect system should be used (see Fig. 3), preferably of a type which will effectively separate primary and domestic hot water. It is the responsibility of the specifying authority to ensure that the system will satisfy this requirement.

The flow pipe should rise vertically immediately after leaving the flow connection for a minimum of 300 m.m. (12 in.).

The ratio of horizontal pipe run to vertical pipe rise should not exceed 3 to 1.

Horizontal pipes should rise 25 m.m. (1 inch) every three metres (10 ft.).

Use sweep bends NOT elbows wherever possible. Allow a minimum dimension of 80 m.m. (3.5/32 in.) between the appliance backplate and wall to facilitate connections. The maximum pressure head should not exceed 15.25 metres (50 ft.).

All water storage vessels must be capable of withstanding hot water which may be introduced via the expansion pipe. Please consult the tank manufacturer before fitting plastic or fibreglass type vessels.

The maximum recommended limit for flow and return pipes is 15.25 m (50 ft.) 7.6 m. (25 ft.) flow and 7.6 m (25 ft.) return.

The flow pipe entry must be situated within 75 m.m. (3 in.) of the top of the water cylinder.

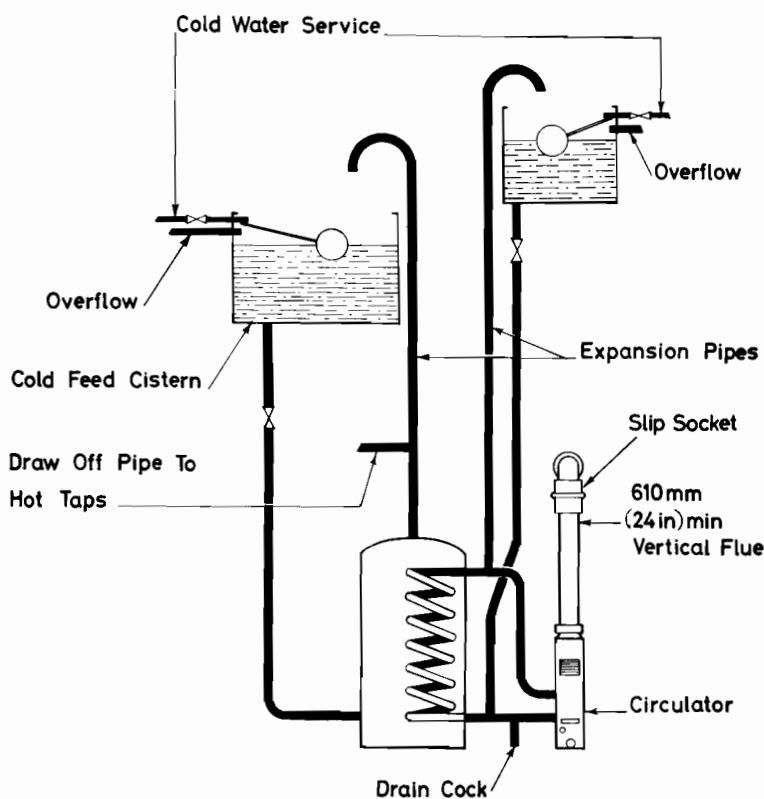
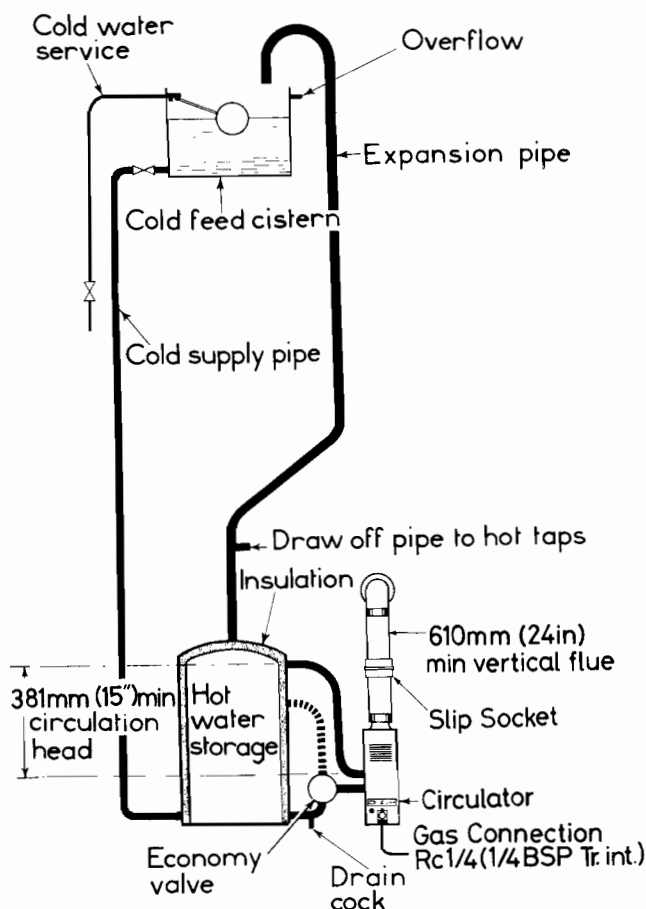


Fig.3

TYPICAL TWIN FEED INDIRECT SYSTEM



**Typical direct system incorporating economy valve (pipework in dotted line
not required if economy valve is not fitted)**

Fig. 4

DIRECT SYSTEMS

The vertical distance between the flow connection on the heat exchanger and the hot water cylinder must be at least 380 m.m. (15 in.). The flow and return pipes should be 22 m.m. (B.S. 2871). A schematic layout of a system is illustrated in Fig. 4.

INDIRECT SYSTEMS

Where the circulating head is between 380 m.m. to 915 m.m. (15 inch to 36 inch) the flow and return pipes should be 28 m.m. Copper (BS 2871). Where the circulating head is above 915 m.m. (36 inch) the flow and return pipes should be 22 m.m. Copper (BS 2871).

If an indirect system is used the thermostat setting may be increased. See section on Commissioning.

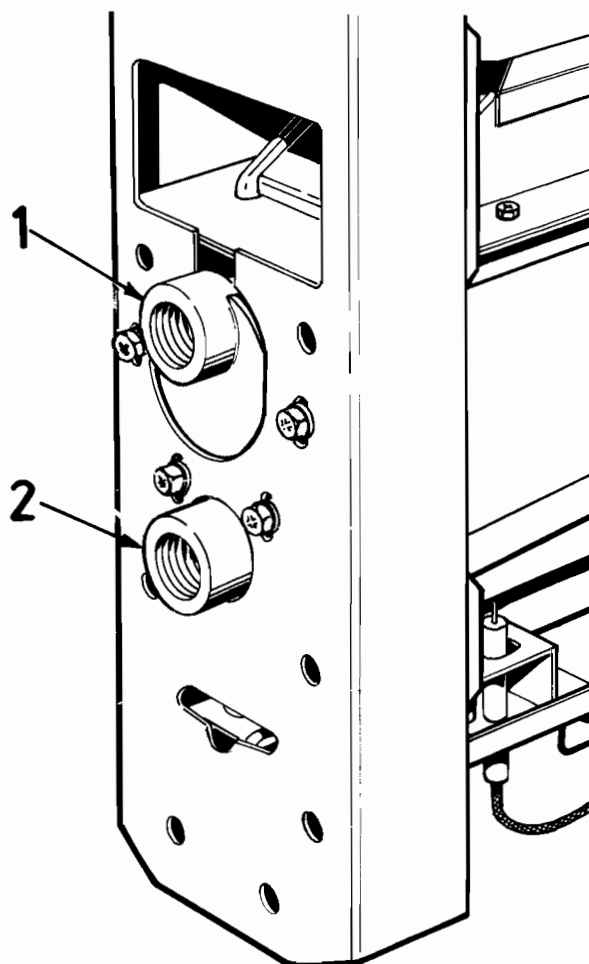
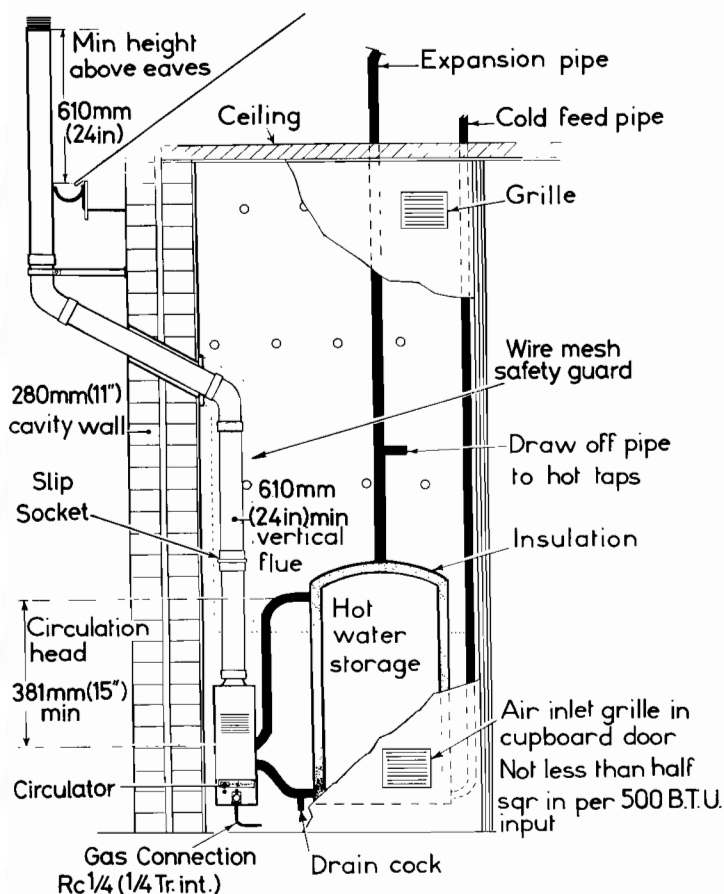


Fig. 5

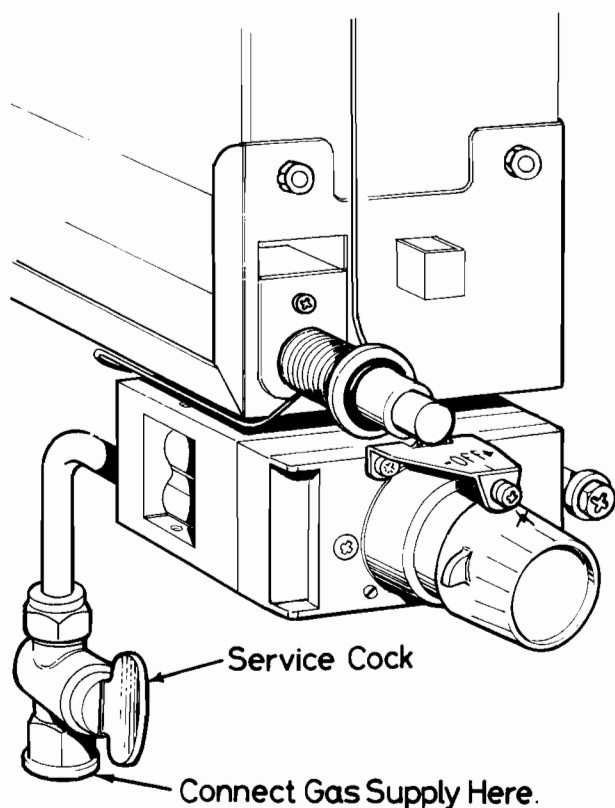
CONNECTION

Connect the flow and return pipes at 1 and 2 (fig. 5) respectively using appropriate fitting. The bosses are threaded Rp $\frac{3}{4}$ in. ($\frac{3}{4}$ in. BSP P/int.).

A drain cock must be fitted at the lowest point on the system.



Typical independent airing cupboard application
(Comply with British Gas installation requirements)
Fig. 6



Note: Siting of service cock can be adapted to suit installation e.g. Fitted horizontally and/or remote from the appliance when floor mounted

Fig. 7

FLUE SYSTEM AND VENTILATION

The Flue adaptor should be connected to a 75 m.m. (3 in.) diameter asbestos or vitreous enamel flue. A slip socket must be fitted to facilitate removal of the diverter hood for routine servicing.

The flue should incorporate a G.C.I., G.L.C. or approved alternative type of terminal either:

- 1) At or above the ridge of a pitch roof OR
- 2) 610 m.m. (24 in.) above the eaves or above the parapet wall of a flat roof.

Wall terminals must not be used.

There shall be at least 610 m.m. (24 in.) of vertical flue between the flue adaptor and the first bend in the flue system. 135° bends are preferred.

IMPORTANT: The circulator must not be installed in any part of a bathroom, bedroom, bed/sitting room or into an adjoining airing cupboard.

Refer to B.S. Code of Practice CP337 and CP333 Part 1 for full requirement of flue and ventilation system etc.

If the circulator is installed in an airing cupboard the latter must be ventilated at high and low level with openings of at least 90.3 sq. cm. (14 sq. in.) free area and must be protected by a wire mesh safety guard (see Fig. 6).

THE GAS SUPPLY

Pipe Sizes

The gas supply pipe can be 12 m.m. copper (BS 2871). If pipe runs are in excess of 6 metres (20 ft.) it may be necessary to increase to 15 m.m. copper (BS 2871). The meter must be capable of passing 15 cu. ft./h of natural gas CV 1000 in addition to other requirements.

Connection

The gas supply must be connected to service cock Rc 1/4 in. (1/4 in. BSP Tr. int.). (Supplied with the appliance). (See Fig. 7).

The pipe between the service cock and the appliance is 12 m.m. copper and has compression fittings.

Important

The gas supply pipe must be positioned such that the controls can be easily withdrawn for servicing.

Gas Pressures

The gas pressures as shown in Table 1 below.

Table 1

Inlet Pressure		Nominal Burner Pressure		Injector
mbar	"w.g.	mbar	"w.g.	
20	3	16.6	2.375	320

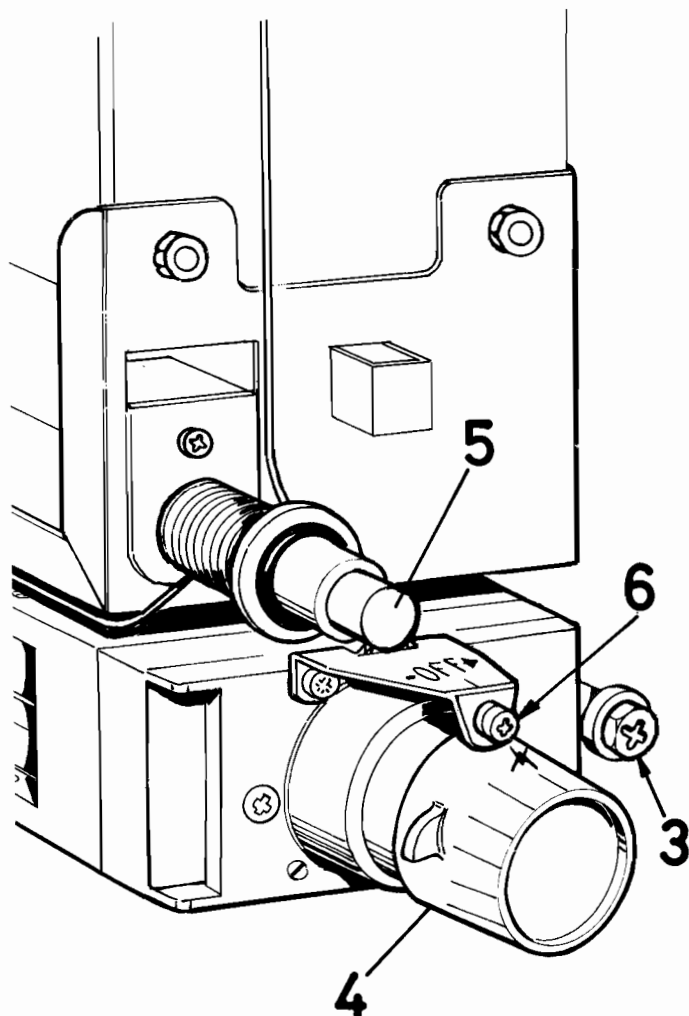


Fig. 8

PRELIMINARY CHECKS AND COMMISSIONING THE SOLENT

Turn on the water supply and check for leaks. Attach a pressure gauge to the test point at 3 Fig. 8 after removing the screw and 'O' ring. Turn on the gas service tap and test for gas soundness.

Turn the control knob (4) anticlockwise until the pilot/ignition position marked  is at the top.

Press IN the control knob. Hold in this position and at the same time push the spark button (5). If the pilot fails to light repeatedly press the spark button until the pilot is alight. The pilot can be observed by looking through the viewing window above the spark button. Hold in knob (4) for approximately 10 seconds then release.

If pilot does not remain alight repeat operations above.

Turn knob 4, which is graduated 1 to 5, fully anticlockwise until the lug on the knob is touching the screw at the top. The main burner will now ignite. The thermostat is now set at approx. 57°C (135°F).

If necessary to check the hot water temperature, see para. 2, page 9, of the "Servicing Instructions".

If an indirect system is used, the temperature can be increased to approximately 82°C (180°F) by removing and discarding the screw (6) and turning the control knob (4) fully anticlockwise to graduation 5. Check that the burner pressure is in accordance with the values shown in table 1.

Hand the 'INSTRUCTIONS FOR USE' leaflet to the consumer and explain how to operate the appliance.

FAULT FINDING CHART

"A" PILOT WILL NOT LIGHT

Cause

1. Gas supply not connected.
2. Gas not turned on.
3. Igniter not sparking.
4. Pilot injector blocked.
5. Pilot jet blocked.
6. Pilot filter blocked.
7. Air in system.

Remedy

- Connect gas supply.
- Turn on gas cock or tap(s).
- Check for tracking of spark.
- Check spark gap.
- Check spark lead connections.
- Exchange spark igniter and/or electrode.
- Clear blockage.
- Clear blockage.
- Wash filter clean or exchange.
- Purge the gas supply.

FAULT FINDING CHART (Con't.)

"B" PILOT WILL NOT STAY ALIGHT

Cause	Remedy
1. Pilot flame too small	Check section A, 5 and 7.
2. Thermocouple tip burnt away.	Exchange thermocouple
3. Pilot not striking thermocouple tip.	Check that thermocouple and pilot are correctly secured to mounting bracket.
4. Loose connection between thermocouple and control unit.	Tighten connection.
5. Faulty thermocouple.	Exchange thermocouple.
6. Blockage in pilot supply pipe.	Clear blockage or exchange pipe.
7. Faulty Electro Magnetic Device.	Exchange Electro Magnetic Unit.

"C" MAIN BURNER WILL NOT LIGHT

Cause	Remedy
1. Pilot not lit.	Light the pilot.
2. Control Knob not turned to gas position.	Turn Control Knob anticlockwise to required setting.
3. Main Burner Injector blocked.	Clear blockage.
4. Faulty "Babysit" Control Unit.	Exchange Control Unit.

"D" NOISY IGNITION OF MAIN BURNER

Cause	Remedy
1. Main burner ports blocked.	Clear blockage.

"E" SLOW OR INCOMPLETE IGNITION OF MAIN BURNER

Cause	Remedy
1. Faulty thermostat.	Exchange "Babysit" Control Unit.
2. Gas tap(s) partially closed.	Open all gas taps.
3. Insufficient gas supply pressure.	Check gas inlet pressure.

"F" WATER NOT BEING HEATED

Cause	Remedy
1. Main burner will not ignite.	Check section "C".
2. Low gas rate.	Check section "E".
3. Blockage of heat exchanger fins.	Clean heating unit thoroughly.
4. Scale deposits in heat exchanger affecting efficiency.	Descale Heating Unit.

"G" WATER BOILING

Cause	Remedy
1. Thermostat bulb not positioned in heating unit pocket.	Fit thermostat in heating pocket.
2. Thermostat faulty.	Exchange "Babysit" Control Unit.
3. By-Pass Screw oversize or not fully screwed in.	Check size and that By-Pass Screw is fully screwed in.

"H" SMELL OF GAS

Cause	Remedy
1. Gas leak.	Notify gas region or locate with soap solution and rectify.

SERVICING INSTRUCTIONS

It is recommended that annual service is carried out on the SOLENT to ensure maximum performance and trouble free service.

1. Remove outer case. See Section 1 of "Dismantling of Appliance".
Remove plastic thermostat retaining plug from heat exchanger (later models only).
Carefully pull off sufficient coiled thermostat capillary as is necessary to remove the thermostat phial from the heat exchanger.
Remove the thermostat phial from the heat exchanger. Light the appliance in accordance with the lighting procedure. Check that the burner pressure is correct as shown on the data badge.
2. Check the hot water temperature.
With the control knob set to number 3½ and the thermostat phial immersed in a suitable container of water, gradually increase the water temperature by heating or adding hot water from a kettle until the water temperature is 55°C (131°F), the manufacturing tolerance of the thermostat calibration is $\pm 5.5^{\circ}\text{C}$ (10°F). The main burner should now have just cut down to the by-pass rate. The main burner flame should be less than 1/4 in. high. If flame is higher than approx 1/4 in. then either the thermostat is incorrectly calibrated or the by-pass screw is incorrect. The by-pass screw (see Key no. 23 Fig. 9) which is positioned at the front of the multifunctional control unit and sealed with paint must be fully screwed in. Check that the by-pass screw is not oversize, the size no., 40, is stamped on the head. Check that the by-pass orifice is not blocked, if necessary, clear by blowing through or washing in a solvent solution. Do not clear by poking with a pin or wire etc. If the thermostat is incorrectly calibrated, exchange the multifunctional control unit (see section 2 of "Dismantling the Appliance").
3. Check that flame failure device operates correctly.
Turn the control knob fully clockwise. The magnetic valve should be heard to snap off within 40 seconds.
4. Re-light the pilot to check the spark ignition system. Fit new electrode and/or spark generator as required.
5. Check that the pilot remains alight when control knob is held in for 10 seconds after pilot ignition. If pilot does not remain alight the pilot may be blocked.
6. Remove the complete control assy. as described in Section 1 of "Dismantling the Appliance".
Remove pilot jet and clean by blowing through the orifice or washing in acetone or similar solvent. Do NOT clear the injector with a pin or wire. If necessary exchange Pilot Filter or wash clean using acetone or a similar solvent. When re-fitting the Pilot ensure the elongated hood on the top of the Pilot is facing towards the thermocouple.
Main injector may require cleaning in a similar manner, described above.
If injector is damaged or incorrect size, fit new injector.
Ensure that the thermocouple tip is clean.
Remove any carbon build up on the thermocouple.
Fit new thermocouple if tip is burnt out.
Spark gap between electrode and pilot jet is 4 m.m.
Check main burner ports are clear of deposits and venturi is not restricted. Clear by brushing if necessary.
Check that fins and flueways are clear.
Was clean if necessary after removing complete control assy. and primary flue assy., see sections 1 and 8 of "Dismantling the Appliance".
If the heater is noisy, the heat exchanger may require descaling. Chemical descaling may be carried out using a proprietary descaling solution
7. Re-fit complete control assembly by offering up the chassis tags to the heat exchanger so that they are on the outside of the combustion chamber. Slide into the assembled position ensuring that the central tag is fully engaged into the stainless steel support bracket on the combustion chamber. Complete the assembly in reverse order of Section 1 "Dismantling of Appliance". Check controls for pressure setting and gas soundness.

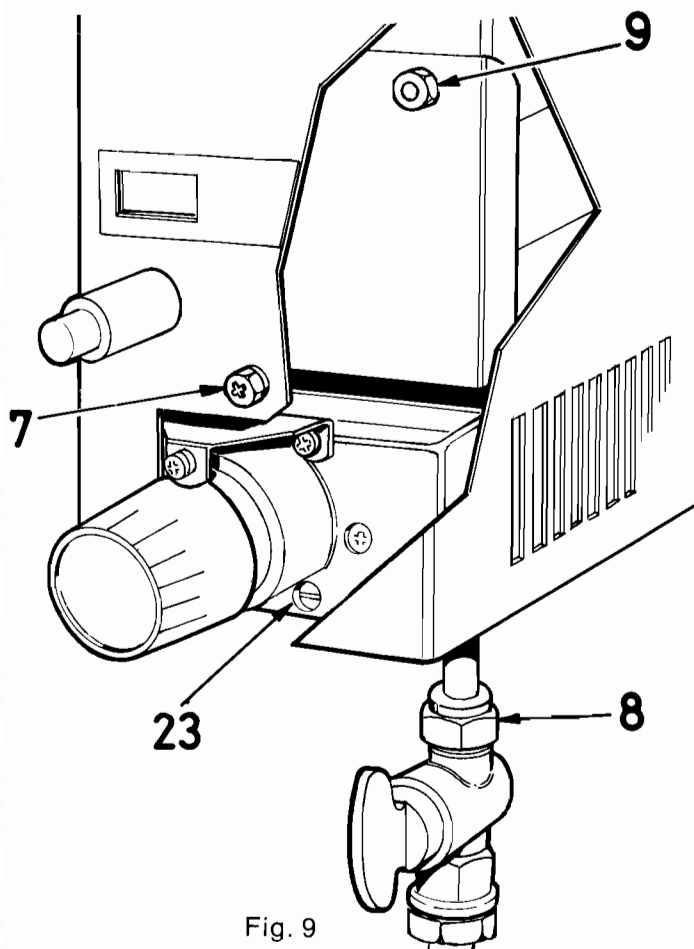


Fig. 9

DISMANTLING THE APPLIANCE

1. TO REMOVE COMPLETE CONTROL AND BURNER ASSEMBLY

Turn OFF the gas supply.

Remove case securing screw at 7 Fig. 9 and remove outer case by lifting slightly upwards to clear locating lugs at rear of case and pulling forward.

Disconnect the gas supply at 8 Fig. 9.

Remove the two hex. nuts at 9 Fig. 9 securing the control assy. to the heating unit.

Pull off washer from spark generator.

Remove plastic thermostat retaining plug from heat exchanger (later models only).

Carefully pull off the coiled thermostat capillary from the spark generator at the same time withdrawing the thermostat phial from the heat exchanger.

Carefully withdraw the complete control assy. (including burner).

2. TO REMOVE MULTIFUNCTIONAL CONTROL UNIT

Turn OFF the gas supply.

Remove single screw securing outer case above control knob.

Remove outer case by lifting slightly upwards to clear locating lugs at rear of case and pulling forward.

Pull off washer from spark generator.

Remove plastic thermostat retaining plug from heat exchanger (later models only).

Carefully pull off the coiled thermostat capillary from the spark generator at the same time withdrawing the thermostat phial from the heat exchanger.

Disconnect the gas supply pipe at 8 Fig. 10.

Disconnect the thermocouple at 12 Fig. 10.

Disconnect the gas feed tube at 24 Fig. 10.

Disconnect pilot feed tube at 25 Fig. 10.

Remove the two screws securing controls chassis at 26 Fig. 10 to multifunctional control unit.

3. TO REMOVE THE BURNER

Remove complete control and burner assy. (see section 1).

Remove main feed tube between control valve and burner after releasing union connections at each end.

Unscrew the injector 10 Fig. 11 and lift out the main burner.

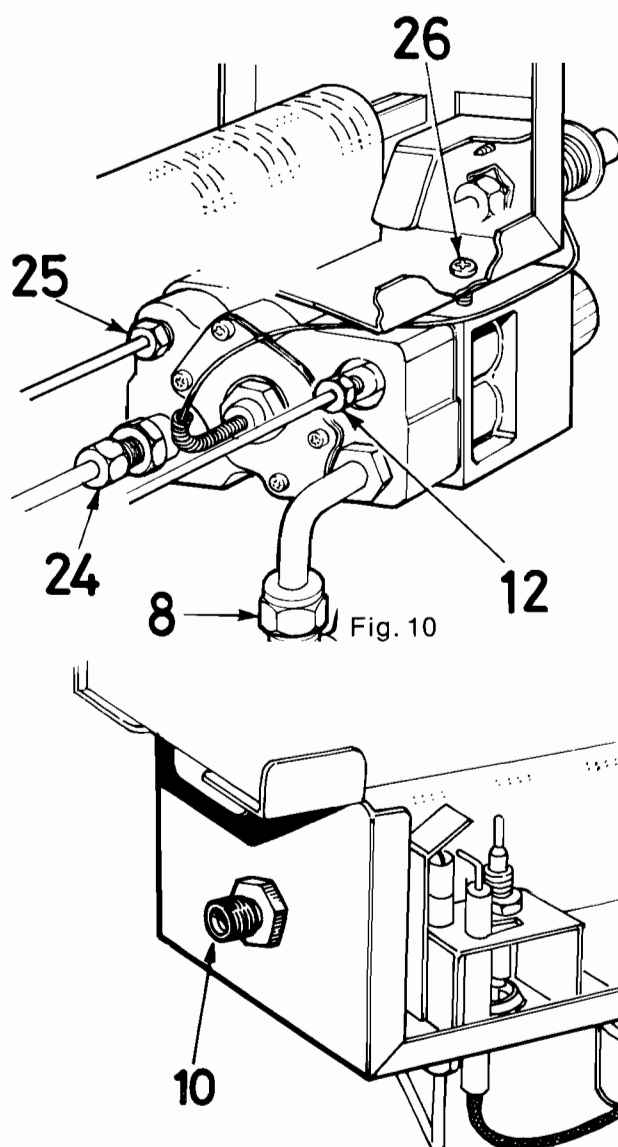


Fig. 11

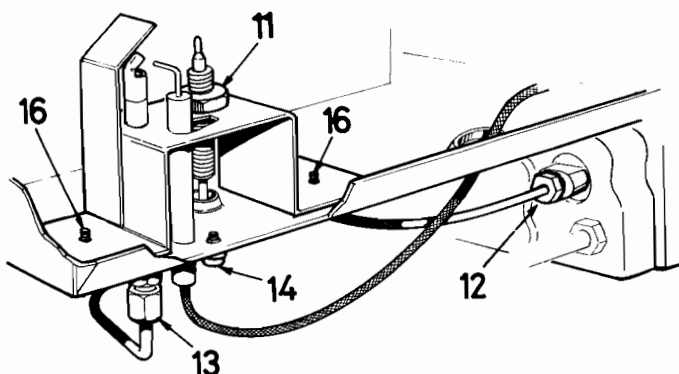


Fig. 12

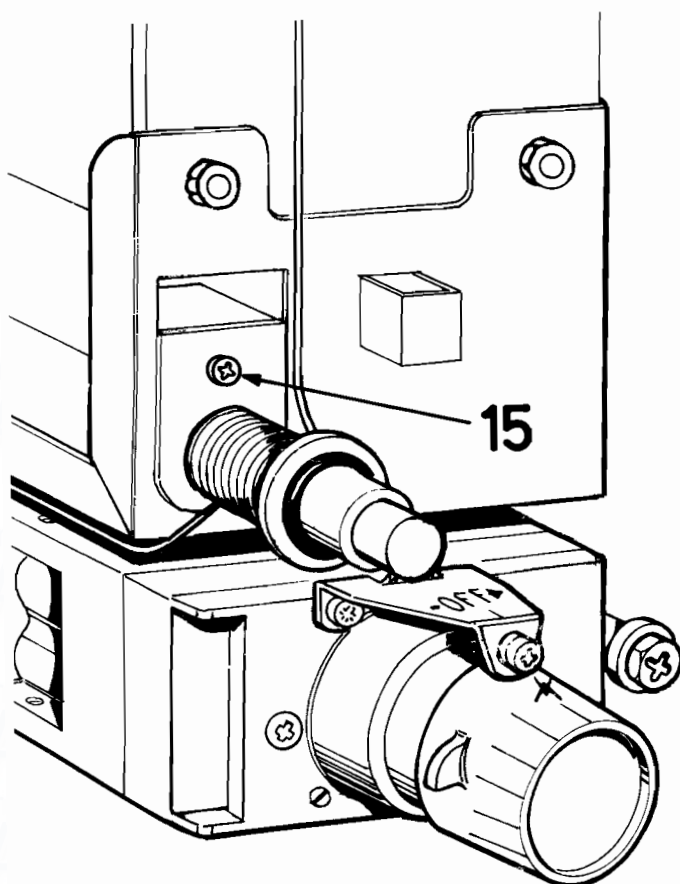


Fig. 13

4. TO REMOVE THE THERMOCOUPLE

Remove complete control and burner assy. (see section 1).

Disconnect locknut 11 Fig. 12 and the union connection 12 Fig. 12 at the rear of the control unit.

Withdraw the thermocouple.

5. TO REMOVE THE PILOT INJECTOR (AND PILOT FILTER)

Remove complete control and burner assy. (see section 1).

Release screw 14 Fig. 12 and remove spark electrode.

Release Thermocouple securing nut (11).

Remove two bracket securing screws at (16) and remove bracket.

Release union connection 13 Fig. 12 at base of pilot injector taking care not to lose the pilot filter, and slacken pilot tube connection at rear of multi-functional control. Unscrew the knurled locking ring and pilot injector to remove.

To reassemble, screw pilot injector into the chassis and loosely assemble the locking ring.

Assemble the remaining parts in reverse order ensuring that the elongated hood of the pilot head is facing the thermocouple.

Before replacing the electrode tighten the knurled locking ring into the underside of the pilot head.

6. TO REMOVE THE SPARK ELECTRODE

Remove complete control and burner assy. (see section 1).

Remove screw 14 Fig. 12 securing the spark electrode to chassis.

Pull off the connection at rear of spark igniter.

7. TO REMOVE SPARK GENERATOR

Remove complete control and burner assy. (see section 1).

Pull off the spark electrode connection at rear of spark igniter.

Carefully pull off capillary from spark generator. Remove screw 15 Fig. 13 at front of chassis and lift out the spark generator and bracket.

Unscrew locknut at rear of bracket securing spark generator.

8. TO REMOVE PRIMARY FLUE

Remove case securing screw above control knob at 7 Fig. 9 and remove outer case by lifting slightly upwards to clear locating lugs at rear of case and pulling forward.

Remove the four screws securing the primary flue assy. to the heat exchanger. Disconnect the flue system and remove the primary flue assembly.

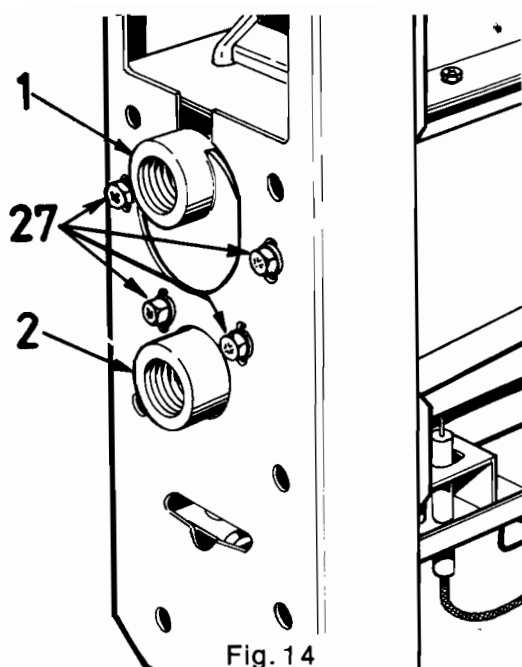


Fig. 14

9. TO REMOVE HEAT EXCHANGER

Remove complete control and burner assy. (see section 1).

Turn off water supply and drain the system.

Disconnect flow and return pipes at 1 and 2 Fig. 14.

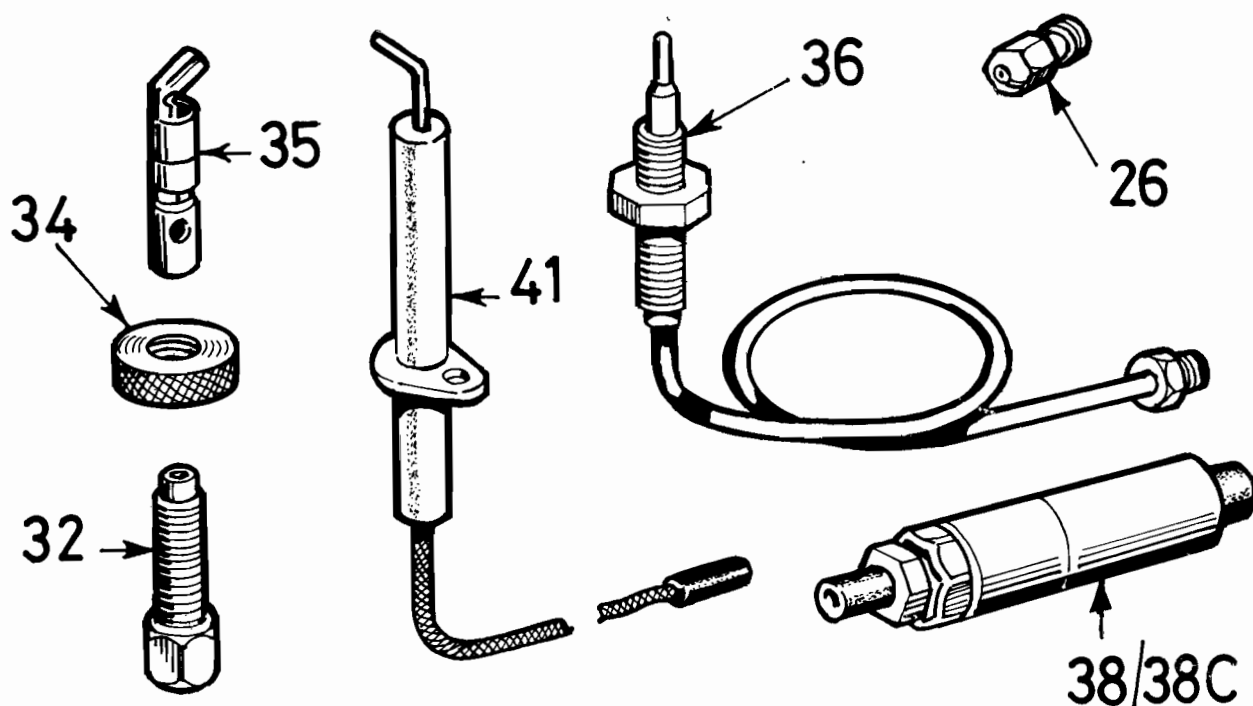
Remove four screws at 27 Fig. 14 securing backplate to heat exchanger.

Withdraw heat exchanger complete with primary flue assembly.

Remove four screws securing primary flue to heat exchanger.

SHORT SPARE PARTS LIST

MAIN SOLENT



Key No.	British Gas Council Part No.	Description	No. off	Makers Part No.
		All items shown above are also listed on the long spare parts list.		
26	340 286	Injector N. G. Size 320 Bray No. 960	1	19-11594
34	340 292	Knurled Nut (Pilot Injector to Pilot Head)	1	12-11826
35	340 293	Pilot Head SIT A1-175-048	1	19-11729
32	340 290	Pilot Injector N. G. Size 7 Bray Cat. 71/7	1	19-11654
41	393 149	Electrode Assy. R. V. 14023	1	10-11587
36	393 437	Thermocouple Sit 0-290-039	1	10-11764
38	387 817	Igniter Spark Generator, Sperry RV 1069	1	10-10083
38C		Igniter Spark Generator, Sperry RV 1174 (Fully interchangeable alternative to Key 38).	1	10-11935